NON-PUBLIC?: N
ACCESSION #: 9310010108
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Oconee Nuclear Station, Unit 2 PAGE: 1 OF 7

DOCKET NUMBER: 05000270

TITLE: OPERATOR ISOLATED POTENTIAL TRANSFORMERS ON THE WRONG UNIT RESULTING IN A REACTOR TRIP
EVENT DATE: 08/25/93 LER #: 93-005-00 REPORT DATE: 09/23/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: POWER LEVEL:

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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Manager

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On August 25, 1993, at 2330 hours, Unit 2 reactor tripped from 100% full power on a Reactor Protective System turbine anticipatory trip signal due to a generator lockout following an indicated loss of load. The loss of load indication occurred when an operator pulled generator metering, relay and regulating equipment drawers to the disconnect position on the Unit 2 generator instead of Unit 1. The operator was supposed to perform the work in preparation for returning Unit 1 generator to service. Post trip operator response stabilized the plant. The root cause of the event is Inappropriate Action (Improper action; the action chosen was incorrect because of a lack of attention to detail). Corrective actions include reemphasizing the Stop, Think, Act, Review (STAR) process, adding Unit specific labeling and repairing locks on the equipment.

END OF ABSTRACT

BACKGROUND

Three cubicles, (one per phase) located under the electrical generator (EG) EIIS:GEN! contain surge capacitors and potential (voltage sensing) transformers. These devices are for regulating and metering outputs and for protective relaying of the EG. Each cubicle contains four "drawers". One drawer in each phase contains surge capacitors for absorbing surges to protect the phases and the EG. The second drawer contains a regulating potential transformer used for controlling and regulating EG output. The third drawer contains metering potential transformers used to indicate and meter EG operation in the control room. The fourth drawer contains the potential transformer that feeds protective relaying associated with the EG. The operations group at Oconee is responsible for the nine (9) potential transformer drawers. The three (3) surge capacitor drawers are the responsibility of the transmission group.

When the EG is shutdown for maintenance or testing these drawers are opened to remove the transformers from the circuitry for the protection of personnel.

The EG uses the protective components mentioned above to sense abnormal conditions which may adversely affect the EG. When such a condition is sensed, it produces a lockout which will open the main generator breakers, EIIS:BRK!, Power Circuit Breakers (PCB)-23 and -24, and trip the turbine. A loss of load indication will generate a turbine generator trip. A turbine trip will produce a reactor trip when power is greater than 30 % full power by actuating Reactor Protective System (EIIS:JC! turbine anticipatory trip channels. The purpose of this trip is to limit Reactor Coolant System EIIS:AB! pressure and prevent challenging the Power Operated Relief Valve.

EVENT DESCRIPTION

On August 25, 1993, Unit 1 was at hot shutdown following a reactor trip from the previous day. Unit 2 was at 100% full power.

At approximately 1900 hours, Unit 1 Nuclear Assistant Shift Supervisor (NASS) A informed Nuclear Operations Specialist (NOS) A that the procedure "Removing Backcharging from the Unit 1 Main and Auxiliary Transformers" (OP/0/A/1107/05 enclosure 3.2) would be performed during the shift.

At approximately 2030 hours, NOS-A was informed by radio that the

procedure was ready to be performed. NOS-A returned to the control room area where a pre-job briefing was performed with NOS-A by NASS-A and NASS-B. All the steps in the procedure were either in the switchyard or transformer yard

except step 2.4.7, "Place and tag the nine (9) GENERATOR POTENTIAL TRANSFORMERS drawers in the REMOVED TO GROUND position. (Drawers pulled out, latched, and Red Tagged)." The briefing included the discussion concerning the knowledge of NOS-A for performing each step. NOS-A had performed this procedure previously.

At approximately 2105 hours, the portion of the procedure to be performed by NOS-A was begun. After some delays associated with other steps in the procedure, NOS-A proceeded to the area of the Unit 1 generator potential transformer drawers, at 2322 hours. NOS-A had nine (9) red tags identified as Unit 1 potential drawer number 1 through 9. However, the wording on the red tags did not match the labeling affixed to the drawers. The procedure for removing the backcharging on the main and auxiliary transformers has the operator open nine (9) drawers for one sign off step and does not delineate the specific drawer nomenclature. NOS-A was unsure if the numbering on the tags was intended to specify a required sequence. NOS-A decided to obtain clarification from NASS-A by telephone. NOS-A found one phone out of order and a second phone in use, so NOS-A went to a phone in the Unit 2 equipment room. NOS-A comm
nicated the concern about the sequencing to NASS-A and was informed that no sequencing was necessary as long as all nine (9) potential drawers were tagged. NOS-A left the Unit 2 equipment room and proceeded to the potential transformer drawers for Unit 2 instead of Unit 1.

The Turbine Building is color coded with demarcation lines and walkways. The equipment tagging was properly color coded but did not specify the specific Unit. The locks for the potential transformer drawers for all nine (9) drawers on Unit 2 were broken and therefore the drawers could be opened without a key. The Unit 1 potential drawers were locked but none of the personnel involved in the job recognized that a key would be required.

At approximately 2330 hours, NOS-A began opening the Unit 2 potential transformer drawers. NOS-A opened the X phase Metering Potential Transformer (MPT) drawer which decreased the indicated EG power output. The Y phase MPT drawer was opened next, which further decreased the indicated EG power output. A large megawatt error statalarm was received in the Unit 2 control room and the reactor operator (RO) rioted that the

megawatt meter indicated 580 megawatts. The Integrated Control System (ICS) EIIS:JA! attempted to increase output. The ICS reactor power limit was reached and main feedwater (FDW) EIIS:SJ! pegged high. Reactor Coolant System (RCS) pressure and temperature began decreasing. At 2330:09 hours, RO-A took both FDW masters to manual and decreased FDW flow back to less than the 100% value. This stabilized Tave at 575 F and RCS pressure at approximately 2000 psig. When NOS-A opened the Z phase MPT drawer, the indicated EG power output went to 0. The NOS-A then opened the Z phase Relaying Potential Transformer (RPT) drawer. When the Z phase RPT drawer

was opened, the main turbine tripped, resulting in a reactor anticipatory trip on Unit 2, at 2330:46 hours. NOS-A did not associate these actions with the trip and continued to open the other potential transformer drawers on Unit 2. All full length control rods fully inserted into the core and the reactor was shutdown. RO-A placed the FDW masters back to automatic and began performing actions in the Emergency Operations Procedure (EOP) as directed by the EOP reader.

Following the reactor trip the average Reactor Coolant System (RCS) temperature decreased from 575 F to 551 F and the RCS pressure decreased from approximately 2100 psig to 1833 psig. Pressurizer level decreased from 219 inches initially to a minimum of 60.9 inches. Steam Generator (SG) "A" pressure increased to a peak of 1114.5 psig and decreased to a minimum of 995 psig. SG "B" pressure increased to a maximum of 1106.4 psig and decreased to a minimum of 992 psig. The SG levels decreased to a minimum of 22 inches before stabilizing at 25 inches, on each SG. As systems and operators responded to the trip, RCS pressure reached a maximum of 2205 psig and stabilized at approximately 2145 psig. The pressurizer level increased to a maximum of 158 inches before stabilizing at 118 inches.

Power was lost to the Radiation Monitors control room indications momentarily due to the affect of transferring auxiliary power sources on the monitoring computer. After the transfer, the computer reset itself arid indication was restored.

NOS-A was notified that Unit 2 was tripped, after completing the opening of the nine potential transformer drawers. NOS-A realized the error that was made and reported to the NASS. The Unit 2 drawers were returned to service and the Unit 1 drawers opened.

On August 26, 1993, at 0820 hours the post trip review was completed and Operations began to start up the reactor. At 1950 hours, the unit was

returned to service.

CONCLUSIONS

The root cause of this event is Inappropriate Action (Improper action; lack of attention to detail). The Nuclear Operations Specialist (NOS) was initially on the correct Unit. However, after leaving the equipment and returning, NOS-A did riot properly verify the correct component prior to performing the task. Duke Power has implemented the Stop, Think, Act, Review (STAR) process, which should have been used. The specifics taught by this process include questioning the correct Unit and equipment prior to performing work.

A HPES evaluation was performed and several factors were identified which contributed to the event. Communications equipment in the area of the potential transformers was not working, or was in use, causing the NOS to exit the immediate area of the work to be performed. Nomenclature on the red tags and the procedure did not match the equipment name tags in the field. Also the equipment name tags did not include the unit designation. The drawers were equipped with key locks, however, the locks were not unit specific and were broken on Unit 2. These items contributed to the event, however, had the NOS properly utilized the STAR process it is concluded that this event could have been prevented.

Reactor Operator (RO) A took proper actions immediately prior to the trip when the megawatt error occurred. The primary system response to the trip was normal. Reactor Coolant System (RCS) inventory, RCS pressure, and RCS temperature were all maintained within the normal post trip range. The response of the secondary system was also normal with both steam generators' pressure and level maintaining at or near their proper post trip setpoints.

A Problem Investigation Program report (0-093-375) has been generated to address the momentary loss of Radiation Monitors indications in the control room during trips.

A review of past events indicates that this event is recurring. On February 27, 1992, Instrument and Electrical (I&E) technicians inadvertently jumpered a trip circuit on the wrong unit resulting in a Reactor trip (LER 287/92-02). On April 30, 1992, Radiation Protection personnel removed Radiation Monitors from service on the wrong unit (Problem Investigation Process (PIP) Report 2-092-0095). On March 16, 1993, I&E personnel valved out a pressure switch on the wrong Unit (PIP Report 2-092-0098). On June 15, 1993, a Control Room Operator opened a

Unit 1 valve instead of Unit 2 as the procedure specified. (PIP Report 5093-0497). Although color coding and equipment labeling have been enhanced as a result of these events, continued improvement is required. Relabeling activities are in progress.

There were no NPRDS reportable equipment failures associated with this

event. The event did not result in radioactive releases, overexposure of radiation, or personnel injuries.

CORRECTIVE ACTIONS

Immediate

1. Operations personnel safely controlled the Unit after the Reactor trip.

2. The Unit 2 potential transformer drawers were closed.

Subsequent

1. The telephone in the immediate area of the equipment was repaired.

2. Unit designations were placed on the surge capacitor/potential transformer cubicles for all three units.

Planned

1. Revise the procedure for Backcharging Unit and Main Auxiliary Transformers (OP/0/A/1107/05) to specify the exact labeling for each drawer and modify to include bullet steps for each drawer.

2. Reinforce the use of the Stop-Think-Act-Review (STAR) process with emphasis on the correct unit and re-verification after job interruptions exists.

3. Replace all units' potential drawer locks with unit specific locks.

4. Review other components to determine where unit specific locks should be utilized to prevent wrong unit events and modify the locks.

SAFETY ANALYSIS

A loss of electrical generator load and the resulting turbine trip, while at power operation, leads to an imbalance between the amount of power produced in the primary system and the amount of power removed by the secondary system. The Reactor Protective System prevents excessive Reactor Coolant System (RCS) overpressurization and heatup by the actuation of the turbine trip anticipatory reactor trip. That is, the turbine trip will cause a reactor trip in anticipation of increased RCS pressure. This

safety feature successfully actuated during this event. The RCS response remained within the nominal post trip limits. The health and safety of the public was not compromised by this event.

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DUKEPOWER

September 23, 1993

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 270/93-05

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 270/93-05, concerning a reactor trip.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(iv). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

J. W. Hampton

Vice President

/ftr

Attachment

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